# TEST RESULTS OF GRADATION FOR WMM

**Lab ID** : **CP-RW-2017-11-07-01** **Date: 06-09-2017**

**Customer** : Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore.

**Address** : Kodigehalli Sub division, BBMP, Bangalore.

**Project Name** : Patching Pot Holes in Mainand Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08

**Agency** : Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040.

**Customer Reference** : BBMP/EE/BTP/WO/19/2017-18

**Source of Sample** : Sample supplied by Agency

**Sample Condition** : Satisfactory

**Date of Receipt** : 07-11-2017

**Sample ID No** : 2017-11-07-01-01

**Type of Mix** : WMM ( Wet Mix Macadam)

**Date of test** : 07-11-2017

**Oven Dry Weight** : 11000 Grams

| IS Sieve Size(mm) | Weight Retained (gm) | Cumulative Weight Retained (gm) | % Cumulative Weight Retained | % Passing | Spec.I.Vide Table 400.13 MORTH Specification |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0.0 | 100.0 | 100 |
| 45 | 319 | 319 | 2.9 | 97.1 | 95-100 |
| 22.4 | 2250 | 2569 | 23.4 | 76.6 | 60-80 |
| 11.2 | 2175 | 4744 | 43.1 | 56.9 | 40-60 |
| 4.75 | 2258 | 7002 | 63.7 | 36.3 | 25-40 |
| 2.36 | 1627 | 8629 | 78.4 | 21.6 | 15-30 |
| 0.6 | 628 | 9257 | 84.2 | 15.8 | 8-22 |
| 0.075 | 1356 | 10613 | 96.5 | 3.5 | 0-5 |

**Note:-**

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Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, BBMP
Bangalore.

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# TEST REPORT OF AGGEGRATE IMPACT VALUE
## IS: 2386 Part IV

| | | |
|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-07-01** **Date: 09-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. |
| **Project Name** | : | Patching Pot Holes in Mainand Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore- |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 07-11-2017 |
| **Sample ID No** | : | 2017-11-07-01-01 |
| **Type of Mix** | : | Coarse Aggregate for WMM ( Wet Mix Macadam) |
| **Date of test** | : | 07-11-2017 |

| Sl.No | Particulars of observations | Index | TEST 1 | TEST 2 |
|---|---|---|---|---|
| 1 | Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve) | A | 300.2 | 300.2 |
| 2 | Weight of fraction passing 2.36mm sieve After giving 15 blows | B | 73.9 | 74.0 |
| 3 | weight of fraction retained 2.36mm sieve After giving 15 blows | C | 225.9 | 225.8 |
| 4 | Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made. | A-(B+C) | 0.4 | 0.4 |
| 5 | Aggregate impact value | (B/A)*100 | 24.6 | 24.7 |
| 6 | Aggregate impact value ( Mean of two tests) | Pecentage | 24.6 | |

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# DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007 )

| | | |
|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-07-01** **Date: 09-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. |
| **Project Name** | : | Patching Pot Holes in Mainand Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 07-11-2017 |
| **Sample ID No** | : | 2017-11-07-01-01 |
| **Type of Mix** | : | Coarse Aggregate for WMM ( Wet Mix Macadam) |
| **Date of test** | : | 07-11-2017 |

**Result:**

| Index | Percentage of Flakiness and Elongation Index | Secified limits as per MORTH specification table 400-12 |
|---|---|---|
| Flakiness Index | 11.8% | Combined Flakiness & Elongation Index for WMM is Maximum 35% |
| Elongation Index | 12.2% | |
| Combined Flakiness and Elongation Index for WMM | 24.0% | |

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# TEST RESULTS OF GRADATION FOR BC
## IS 2386 (Part 1) 1963 (RA 2007 )

| | | |
|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-13-01** **Date: 15-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. |
| **Project Name** | : | Patching Pot Holes in Main and Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 13-11-2017 |
| **Sample ID No** | : | 2017-11-13-01/01 |
| **Type of Mix** | : | BC-Plant (Bituminous Concrete) |
| **Date of test** | : | 13-11-2017 |
| **Oven Dry Weight** | : | 5000 Grams |

| IS Sieve Size (mm) | Weight Retained (gm) | Comulative Weight Retained (gm) | Comulative % of Retained | Comulative % of Passing | Secified limits as per MORTH specification table 500-17(grading-2) |
|---|---|---|---|---|---|
| 19 | 0 | 0 | 0.0 | 100.0 | 100 |
| 13.2 | 89 | 89 | 1.8 | 98.2 | 90-100 |
| 9.5 | 700 | 789 | 15.8 | 84.2 | 70-88 |
| 4.75 | 890 | 1679 | 33.6 | 66.4 | 53-71 |
| 2.36 | 595 | 2274 | 45.5 | 54.5 | 42-58 |
| 1.18 | 496 | 2770 | 55.4 | 44.6 | 34-48 |
| 0.6 | 499 | 3269 | 65.4 | 34.6 | 26-38 |
| 0.3 | 525 | 3794 | 75.9 | 24.1 | 18-28 |
| 0.15 | 460 | 4254 | 85.1 | 14.9 | 12-20 |
| 0.075 | 355 | 4609 | 92.2 | 7.8 | 4-10 |
| PAN | 391 | 5000 | 100 | 0.0 | 0 |

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# TESTS RESULTS ON STABILITY OF MIX

| | | | |
|---|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-13-01** | **Date: 16-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. | |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. | |
| **Project Name** | : | Patching Pot Holes in Main and Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 | |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. | |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 | |
| **Source of Sample** | : | Hot Mix Plant, Bangalore | |
| **Sample Condition** | : | Satisfactory | |
| **Date of Receipt** | : | 13-11-2017 | |
| **Sample ID No** | : | 2017-11-13-01/01 | |
| **Type of Mix** | : | BC (Bituminous Concrete) | |
| **Date of test** | : | 13-11-2017 | |

**The results of the tests conducted on the Bituminous Concrete mix sample are as follow**

| Sl.No | Particulars of observations | TEST 1 | TEST 2 | Secified limits as per MORTH specification table 500-11 |
|---|---|---|---|---|
| 1 | Marshal Stability at 60°C, KN | 11.14 | 11.13 | 10KN(min) |
| 2 | Marshal flow at 60°C, mm | 3.52 | 3.51 | 2-4 |
| 3 | Percent air Voids | 4.82 | 4.83 | 3-5 |
| 4 | Percent Voids in mineral Aggregate(VMA %) | 14.28 | 14.26 | 13-15 |
| 5 | Percent Voids filled with Bitumen(VFB %) | 71.87 | 71.63 | 65-75 |
| 6 | Density, g/cc | 2.25 | 2.26 | – |

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# TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

| | | |
|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-13-01** **Date: 16-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. |
| **Project Name** | : | Patching Pot Holes in Main and Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 13-11-2017 |
| **Sample ID No** | : | 2017-11-13-01/01 |
| **Type of Mix** | : | BC(Bitumenous Concrete) |
| **Date of test** | : | 13-11-2017 |

| | | |
|---|---|---|
| **Type of Binder** | : | 60/70 |
| **% of Binder Used** | : | 5.0% |
| **Weight of Aggregate** | : | 200.0 gm |
| **Weight of Binder** | : | 10.0 gm |
| **Temperature of water bath** | : | 40°C |

| No of test | Retained Stripping Percentage | Stripping Percentage | Average Retained Stripping Percentage | Secified limits as per MORTH specification table 500-8 |
|---|---|---|---|---|
| 1 | 98.5 | 1.5 | 98.3 | Minimum Retained Coating 95% |
| 2 | 98.5 | 1.5 | | |
| 3 | 98.0 | 2.0 | | |

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# PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

| | | |
|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-13-01** **Date: 16-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. |
| **Project Name** | : | Patching Pot Holes in Main and Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 13-11-2017 |
| **Sample ID No** | : | 2017-11-13-01/01 |
| **Type of Mix** | : | BC (Bituminous Concrete) |
| **Date of test** | : | 13-11-2017 |

**Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete**

| Property | Test | Result | Specification | Method of Test |
|---|---|---|---|---|
| Partical Shape | Flakiness Index | 12.4 | Combined Flakiness & Elongation Index for BC is Maximum 35% | IS:2386 Part I |
| | Elongation Index | 11.8 | | |
| Strength | Aggregate Impact Value | 22.1 | Maximum 24% | IS:2386 Part IV |
| Specific gravity | Specific gravity | 2.68 | Maximum 2.7 | IS:2386 Part III |
| Water Absorption | Water Absorption | 0.21 | Maximum 2% | IS:2386 Part III |

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## TEST RESULTS OF GRADATION FOR BC
### IS 2386 (Part 1) 1963 (RA 2011 )

| | | | |
|---|---|---|---|
| **Lab ID** | : | **CP-RW-2017-11-20-01** | **Date: 22-11-2017** |
| **Customer** | : | Assistant Executive Engineer, Kodigehalli Sub division, BBMP, Bangalore. | |
| **Address** | : | Kodigehalli Sub division, BBMP, Bangalore. | |
| **Project Name** | : | Patching Pot Holes in Main and Cross Roads of Balaji Layout Bhadrappa Layout Maruthinagara BB Nagara Shanthinikethana and Surroundings Areas in Ward No.08 | |
| **Agency** | : | Sri.Sanjay Reddy H.J, #09, 'K' Main, Hosahalli, Vijayanagara Bangalore-560 040. | |
| **Customer Reference** | : | BBMP/EE/BTP/WO/19/2017-18 | |
| **Source of Sample** | : | Sample supplied by Agency | |
| **Date of Receipt** | : | 20-11-2017 | |
| **Sample ID No** | : | 2017-11-20-01/01 | |
| **Type of Mix** | : | BC (Bituminous Concrete) | |
| **Date of test** | : | 20-11-2017 | |

| Sl.no | Description | Index | Trail 1 | Trail 2 |
|---|---|---|---|---|
| 1 | Weight of the Sample | A | 500 | 501 |
| 2 | Weight of the sample After extraction | B | 477 | 476 |
| 3 | Bitumen percentage | $\frac{A-B}{A} \times 100$ | 4.60 | 4.99 |
| 4 | Average percentage | % | 4.8 | |

AP W-8

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**Lab ID** : **CP-RW-2017-11-20-01** **Date: 22-11-2017**

**Sample ID** : **2017-11-20-01/01**

**AFTER EXTRACTION - Trail-1**

**Total Weight of the Sample(gm)** : 478.5

| IS Sieve Size (mm) | Weight Retained (gm) | Comulative Weight Retained (gm) | Comulative % of Retained | Comulative % of Passing | Secified limits as per MORTH specification table 500-23(grading-2) |
|---|---|---|---|---|---|
| 19 | 0 | 0 | 0.0 | 100.0 | 100 |
| 13.2 | 4 | 4 | 0.8 | 99.2 | 90-100 |
| 9.5 | 62 | 66 | 13.8 | 86.2 | 70-88 |
| 4.75 | 112 | 178 | 37.2 | 62.8 | 53-71 |
| 2.36 | 88 | 266 | 55.6 | 44.4 | 42-58 |
| 1.18 | 29 | 295 | 61.7 | 38.3 | 34-48 |
| 0.6 | 11 | 306 | 63.9 | 36.1 | 26-38 |
| 0.3 | 46 | 352 | 73.6 | 26.4 | 18-28 |
| 0.15 | 45 | 397 | 83.0 | 17.0 | 12-20 |
| 0.075 | 55 | 452 | 94.5 | 5.5 | 4-10 |

**AFTER EXTRACTION - Trail-2**

**Total Weight of the Sample(gm)** : 478

| IS Sieve Size (mm) | Weight Retained (gm) | Comulative Weight Retained (gm) | Comulative % of Retained | Comulative % of Passing | Secified limits as per MORTH specification table 500-23(grading-2) |
|---|---|---|---|---|---|
| 19 | 0 | 0 | 0.0 | 100.0 | 100 |
| 13.2 | 5 | 5 | 1.0 | 99.0 | 90-100 |
| 9.5 | 62 | 67 | 14.0 | 86.0 | 70-88 |
| 4.75 | 115 | 182 | 38.1 | 61.9 | 53-71 |
| 2.36 | 78 | 260 | 54.4 | 45.6 | 42-58 |
| 1.18 | 31 | 291 | 60.9 | 39.1 | 34-48 |
| 0.6 | 9 | 300 | 62.8 | 37.2 | 26-38 |
| 0.3 | 48 | 348 | 72.8 | 27.2 | 18-28 |
| 0.15 | 47 | 395 | 82.6 | 17.4 | 12-20 |
| 0.075 | 56 | 451 | 94.4 | 5.6 | 4-10 |

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Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
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